Investigating the role of disaggregated economic freedom measures and FDI on human development in Africa

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Abstract

Purpose – The purpose of the study is to investigate the role of disaggregated economic freedom measures in the foreign direct investment (FDI) and human development nexus.

Design/methodology/approach – The study uses a panel data of 32 selected African countries from 1996 to 2017. A dynamic ordinary least squares (DOLS) with fixed effects and instrumental variable (IV) econometric techniques was used to address issues of endogeneity and serial correlation commonly associated with panel time series data.

Findings – The Results indicate that FDI without accounting for absorptive factors has a positive but insignificant effect on human development for the selected African countries. However, FDI has a positive and significant effect on human development when interacted with measures of economic freedom such as investment freedom, business freedom and financial freedom. In contrast, yet plausible, FDI has a negative influence when interacted with property rights, trade freedom, government integrity and tax burden.

Practical implications – The study posits that to attract FDI into Africa with the purpose of improving human development, relevant absorptive capacities such as business, investment and financial freedom environment are critical. However, excessive capital flight and government interference through taxation and abuse of property rights should be controlled if the continent seeks to promote human development through FDI.

Originality/value – The novelty and originality of the study, are evident in the use of disaggregated measures of economic freedom as comprehensive absorptive capacities to examine how they complement FDI to impact on human development in Africa.

Keywords Economic freedom, FDI, Human development, Absorptive capacity, Dynamic panel

Paper type Research paper

1. Introduction

In 2015, member states of the United Nations approved the Sustainable Development Goals (SDGs) with the key objective of promoting human development across the world. Among other things, parties to this agenda expect to see an end to poverty, protection for the planet and prosperity for all by 2030. Thus, member states have roles to play in meeting this target. However, the inclination is not without possible questions for a continent like Africa. For example, to what extent can Africa live up to the task in closing the development gap given this target? Should the world expect something that may be different from what was seen under the Millennium Development Goals? Whilst optimists may believe that Africa can close the development gap, pessimists may have some justifiable doubts. The former may have no reason for such optimism because Africa lacks the socio-economic and political freedom to attract the needed physical and human capital as well as foreign technology.

Generally, human development priorities hinge on domestic and external resource requirements (UNDP, 2016). Mobilization of the former has generally been low in developing

countries. This has provided some justification for external resources such as foreign direct investment (FDI) to be harnessed. Naudé and Krugell (2007) have argued that FDI as an important external resource requirement may provide part of the solutions to Africa's challenges. Africa is currently lagging in development, however, Owusu-Nantwi (2019) has shown that FDI can drive economic development in developing economies through spillover effect. Unfortunately, apart from the fact that inflows have generally been low on the continent, certain fundamental absorptive capacities that border on socio-economic and political freedom have not satisfactorily complemented inflows to translate into human development. This has resulted in low economic growth rates, persistent poverty, political and economic unrest, and high inequality in Africa.

FDI (see Alfaro et al., 2004; Dhrifi, 2015) and economic freedom (see Acikgoz et al., 2016) are separately known to be important determinants of economic growth in the development literature. Economic freedom is explained by the Heritage Foundation (2018) as the fundamental right of people to control or make choices on the use of their own labour and property. In a free market economy, firms and individuals have some degree of freedom and are free to make self-interest choices. In such societies, governments allow labour, capital and goods to move freely and refrain from excessive regulation above the level necessary to promote development (Gwartney and Lawson, 2013). FDI involves the ownership and control of productive resources by economic agents in another country. It is important to indicate that although FDI inflows to African countries have risen substantially since the 1990s, human development measured by the Human Development Index (HDI) has not risen much as expected (see Figure 1). Clearly, FDI inflows exist and are affected by economic, social, cultural and political environments. In countries where these catalytic socio-economic factors are absent, FDI inflows are constrained coupled with feeble or no impact on livelihoods or well-being.

From Figure 1, we can observe that average FDI inflows to Africa between 1996 and 2017 have been fluctuating around a rising trend while HDI rises marginally. Fluctuating flows of FDI seem to have no direct effect on human development. This phenomenon is expected because amounts of investments in the region are below requirements needed to ensure significant improvement in HDI (i.e. education, health and standard of living). The study uses a five-year moving average to predict the trend for 2018–2020 and finds almost a similar
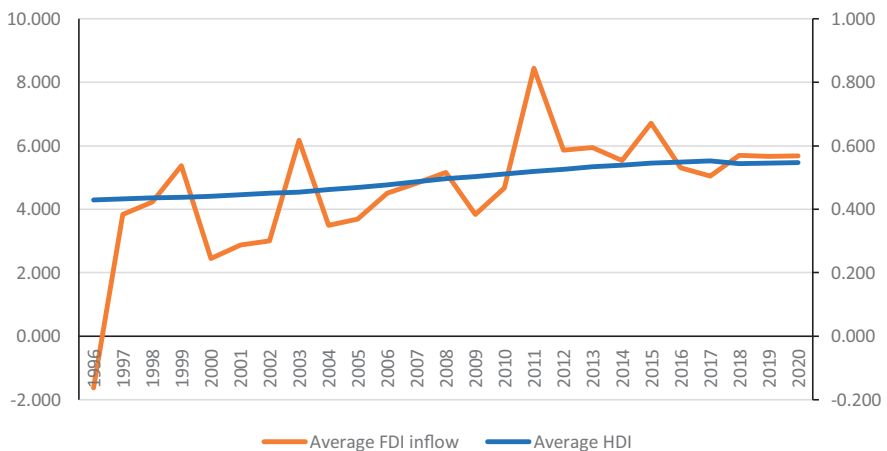

Figure 1.
Average HDI and FDI trends in Africa

Source(s): Authors' construction with data from World Development Indicators, 2018

trend. Given this rising trend, one cannot attribute the marginal rise in HDI to an increase in FDI. That is, the trend does not show a conclusive evidence on the relationship, as so many factors have not been accounted for. Therefore, an empirical statistical evidence is needed to show whether FDI improves HDI in Africa when economic freedom is accounted for, which is a driving motivation for this current study.

In our quest to contribute towards the debate on FDI, absorptive capacity and human development, we first acknowledge that a myriad of studies exists on the subject which has mainly focussed on the link between FDI and economic growth. It is worth pointing to the fact that most empirical studies (such as Bengoa and Sanchez-Robles, 2003; Johnson, 2006; Azman-Saini *et al.*, 2010) have attempted to investigate the effect of FDI on economic growth, with majority establishing a positive relationship. However, others such as Teking (2012) have found a negative effect of FDI on economic growth while Herzer *et al.* (2008) also found mixed results.

In respect of the gap, there is paucity of literature explaining the effect of FDI on human development, especially for Africa. One of such few studies was conducted by Reiter and Steensma (2010), who examined the effect of FDI on economic and human development in developing countries. Their results indicate a significant positive effect of per capita FDI on HDI after controlling for corruption. This implies that if developing countries are free from corruption, per capita FDI will positively impact HDI. Following this finding, we argue the need to account for a broader measure of institutional quality that borders on the subject under investigation. We resort to the disaggregated measure of economic freedom in order to provide adequate absorptive capacities that can translate FDI gains into human development. Thus, the point of departure from existing studies is that we interact FDI with the disaggregated economic freedom measures to examine how the several economic freedom measures and FDI together impact HDI in Africa.

This paper is unique in several ways. First, we use a panel of 32 African countries based on data availability over a period of 22 years (1996–2017). Second, we improve on methodological aspects by acknowledging possible identification issues and conclude in line with Naudé and Krugell (2007) that ordinary least square (OLS) as used by Asiedu (2002) may not be appropriate for our estimation. So, we use instrumental variables (IV) and the dynamic ordinary least square (DOLS) with fixed effects techniques because of their strengths in dealing with endogeneity and serial correlation issues. Third, this study helps to clear the maze on FDI and development with evidence supporting the view that FDI alone does not significantly impact HDI in developing countries.

This paper is structured as follows: Section 2 presents the empirical literature review, Sections 3 and 4 discuss the methodology and the analysis of results, respectively and Section 5 concludes the study.

2. Literature review
In theory, inflows in the form of FDI from the developed world play a key role in propelling economic growth and human development process in developing countries. Based on theoretical and empirical justifications, Blomstrom *et al.* (1994) have argued that the potency of FDI to developing countries' growth prospects is contingent on the host country's absorptive capacities. For developing countries in Africa with poor absorptive capacities, Azman-Saini *et al.* (2010) posit that the effect of FDI on economic growth might be weak. In simple terms, absorptive capacity refers to an economy's capacity to reap benefits spilled over by FDI. That is, factors that influence an economy's ability to absorb the knowledge and technology spillovers (Ajide and Eregha, 2015). Human capital, financial development, economic freedom, quality of institutions and infrastructure are all examples of absorptive capacity factors examined in literature. Beneficiary countries must have these qualities, that will allow them to reap benefits linked to FDI inflows (Khordagui and Saleh, 2013).

Most of these proxy variables for absorptive capacities have not been well-accounted for in the literature on HDI. As a starting point, we consider economic freedom because of its versatility, coverage and scope. Economic freedom is the fundamental right of individuals to control their resources. In an economically free society, individuals have liberty to engage in economic activities, consume and accumulate wealth in any way they please. As earlier mentioned, in economically free societies, governments allow factors of production and goods to move freely, with little or no restrictions (Heritage Foundation, 2018). Economic freedom as an important absorptive capacity has been identified as a fundamental condition to attract FDI. It is also generally acknowledged that countries with freer economies tend to attract more FDI and develop faster than countries where there are restrictions and excessive regulation (see Heritage Foundation, 2018).

As earlier indicated, studies examining the effects of FDI and absorptive factors on human development are not common. The closest study is that of Reiter and Steensma (2010). While accounting for FDI policy and corruption, they examined the effect of FDI on human development among 49 developing countries from 1980 to 2005. Using HDI as a measure of human development following best practice in the literature, they found a significant positive effect of per capita FDI on development. They recommended that corruption must be eliminated in order to enhance poverty reduction. In other words, absorptive capacities are key to improving human well-being through FDI.

Similarly, Dollar and Kraay (2004) investigated the relationship among international trade, growth of FDI and poverty. They estimated their model with the method of moments and instrumental variable methods for over 100 countries from 1970 to 2000. They established that FDI and trade positively affect human development leading to rising income levels and reduction in poverty.

In addition, Basu and Guariglia (2007) investigated the links among FDI, inequality and growth relation using a panel of 119 countries from 1970 to 1999. They constructed an alternative Gini coefficient using levels of education inequality. Using a five-year average of the variables and with OLS fixed effects and generalized least squares, they found a positive relationship between FDI and educational inequality. Also, they discovered that FDI had a positive influence on growth but lead to a reduction in the contribution of agriculture in the host country. Agosin and Machado (2005) also examined the development effect of FDI by testing whether FDI crowds in or crowds out domestic investment. Using a panel dataset of 36 developing countries from Latin America, Asia and Africa from the period 1971 to 2000 they found that FDI has no crowding-in effect on domestic investment.

It is worth mentioning that most of the earlier empirical literature have focused on the effect of FDI and absorptive factors on economic growth. Some of these studies are reviewed because economic growth is a necessary condition for human development. Azman-Saini et al. (2010) tested the relationship between FDI and economic growth by considering the role of economic freedom as a measure of institutional quality. Using a panel of 85 countries over the period 1976 to 2005, they established that countries with greater economic freedom gain significantly from the presence of multinational corporation due to the existence of a positive interaction term. Johnson (2006) investigated whether FDI influences economic growth through technology spillovers and investment. Using a panel dataset consisting of 90 developed and developing countries between 1980 and 2002 and panel fixed OLS estimation technique, he found that FDI has positive influence on economic growth in developing economies but not in developed economies.

Bengoa and Sanchez-Robles (2003) explored the interrelationship among economic freedom, FDI and economic growth. They used 18 Latin American countries for the period between 1970 and 1999. Their results from fixed and random effects models showed that FDI and economic freedom are the growth-enhancing factors among the studied countries. They found that a 1% increase in FDI (as a percentage of GDP) increases economic growth up to

0.5% point. They recommended policies such as widening economic freedom and attracting FDI to increase economic growth.

Other studies however find a mixed effect of FDI on economic growth. Teking (2012) explored potential Granger causality among real GDP, real exports and inward FDI in least developed countries from 1970 to 2009. His findings showed that FDI inflows bring about growth in two countries out of 18 countries. FDI also leads to exports in five out of 18 countries. He attributes the weak evidence of FDI on growth and exports to low levels of FDI to developed countries where a big push is required for development. Herzer *et al.* (2008) had earlier examined the FDI-led growth hypothesis for 28 developing countries from 1970 to 2003. They found that in just four out of 28 countries, FDI positively influences long-run economic growth.

Ajide and Eregha (2015) conducted a unique study examining the effect of FDI inflow and economic freedom on economic performance in 19 sub-Saharan African countries from 1995 to 2010. They used panel fixed and random effects models. In measuring economic performance, they used GDP per capita as well as a disaggregated measure of economic performance – agricultural value- added, manufacturing value-added and services value-added. Their results show that economic freedom has significant positive influence on GDP per capita but has insignificant effects on each of the three sectoral components across countries.

Similarly, Hagan and Amoah (2019) empirically investigated the effects of FDI anchored with a developed financial market that accounts for financial fragility for 40 African countries. The study period was from 1998 to 2012. Using an instrumental variable approach with a pooled ordinary least square for robustness checks, authors found that the growth-promoting effect of FDI is uncertain when the role of financial fragility in financial development is not accounted for. They further established that fragility in financial markets has a potential negative effect in the FDI–growth nexus in Africa. They accordingly suggested the need for policy makers to strengthen creditor protection laws as well as related information infrastructure such as credit information bureaus system in order to reduce the possibility of bad debts. In addition, authors identified the importance of an enabling environment and investment policies, including tax incentives aimed at attracting FDI inflows to Africa.

From the foregoing, we deduce that the effect of FDI on development in general and human development is improving in Africa. The effect of FDI inflows on development in Africa which has relatively weaker institutions, cannot be ascertained. That is, there are several environmental or absorptive factors that either minimize or maximize the role of FDI inflows in Africa which have not yet been thoroughly investigated. This study focusses mainly on the role of FDI with absorptive factors defined by disaggregated components of economic freedom index constructed by the Heritage Foundation.

3. Methodology
The Heritage Foundation (2018) and the World Development Indicators (WDI) by the World Bank (2018) are used as the main sources of data for this study. The economic freedom variables are used as an elaborate proxy for absorptive capacities in order to assess their complementary effect with FDI on human development. For policy purposes, this will help us know components that positively drive human development in Africa. The economic freedom indices (trade freedom [TF], property rights [PR], tax burden [TB], investment freedom [IF], business freedom [BF], government integrity [GI] and financial freedom [FF]) are all sourced from the former, while all other variables (FDI, country dummies, year dummies) are sourced from the latter. All other indices excluded from the model (judicial freedom, fiscal health and labour freedom) were premised on paucity of data (missing data points). In order to investigate the properties of the variables, we present the descriptive statistics of each of the variables used for the estimation of the model in Table 1 (see Table 5 in appendix for detailed description of variables and data sources).

Statistics	HDI	lnFDI (flow)	FDI (flow)	Property rights	Government integrity	Tax burden	Business freedom	Trade freedom	Investment freedom	Financial freedom	Urbanization
Mean	0.49	0.79	4.51	35.85	29.11	70.28	56.05	59.28	45.45	41.37	3.73
Median	0.46	1.02	2.65	30.00	28.10	71.45	55.00	61.10	50.00	40.00	3.87
SD	0.11	1.33	9.08	14.81	12.86	10.66	11.74	13.78	16.24	15.34	1.28
Skewness	0.39	−0.79	3.06	0.36	0.47	−0.65	0.10	−0.85	−0.25	0.03	−0.14
Kurtosis	2.36	5.43	43.10	2.94	2.86	3.17	2.90	3.59	2.52	2.42	3.57
Minimum	0.25	−5.42	−82.89	5.00	7.00	32.80	23.40	16.20	0.00	10.00	−1.23
Maximum	0.75	4.51	89.48	75.00	70.00	90.80	85.00	89.00	80.00	70.00	8.69
N	704	533.00	704.00	704.00	704.00	704.00	704.00	704.00	704.00	704.00	704.00

Note(s): Where SD=Standard deviation, N = Total number of observations

Table 1.
Descriptive statistics of variables

The dependent variable, HDI, is near normal in its distribution. This is because it has a mean that is approximately the same as the median with an associated standard deviation which is less than one. In addition, its skewness is approximately zero and the kurtosis is near three. Similarly, the skewness and the kurtosis of all the independent variables except for FDI are observed to have similar distributions. By implication, these variables are deemed to have distributions that are near normal. However, the raw FDI values show a distribution that is skewed to the right. This lends credence to the fact that the FDI variable must be transformed in order to deal with issues that border on outliers. Using the natural logarithm, the FDI is linearized in the final model before proceeding with the estimation. One must admit that such transformations are not without its challenge of losing some observations. Nonetheless, we argue that the observations used in our final model are still large enough to make informed and unbiased conclusions for the estimated coefficients.

Theoretically informed variables such as urbanization, access to electricity, water and sanitation, etc. are not mandatorily included because the coefficient of determination for all estimated models (see Table 3) are very high; hence, adding additional variables would lead to overspecification or overfitting regression. Nonetheless, to avoid missing variable bias, the study included both country- and year-specific dummies as controls to capture country- and year-specific omitted variables.

3.1 Stationarity and cointegration tests

Given that the data used for the study is a panel time series dataset, one of the important conditions to investigate in order to avoid possible spurious regression is panel unit root properties of the series. Several methods exist for such investigation. To ensure robustness of our results under the assumption that across cross-sections over the period under study, we assume that the coefficients of autocorrelation are either identical (common unit root processes) or not identical (individual unit root processes). Against this background, we use four panel unit root approaches to test the hypothesis of the existence of unit root properties in the series. The test results are presented in Table 2.

From Table 2, the LLC test results show that for the series with common unit root processes, except investment freedom and business freedom, all the other series are stationary at levels. Nonetheless, all the series under the same assumption are stationary at first difference. In addition, for the individual unit root processes, the evidence is slightly different as some of the test results show the presence of unit root in some of the series. Thus, at levels, we do not have evidence of stationarity amongst all the series of the data. However, after first difference, we find evidence of the absence of unit root for all the series irrespective of the test specification. That notwithstanding, we posit that it would not be appropriate to use a standard OLS technique on non-stationary panel data at levels which may lead to spurious conclusions. In such panel time series studies, identification strategies have always been a challenge. One technique that can be used in addressing these issues is the instrumental variable approach. However, according to Sing (2010, p. 236), "The use of instrumental variable (IV) estimator to resolve endogeneity could be beset with problems, if the instruments do not satisfy the orthogonality conditions and are autocorrelated and I(d)". Another econometric strategy that has been used in literature to address this issue is the dynamic OLS (DOLS). According to Sing (2011, p. 1361), DOLS is "unbiased and asymptotically efficient in the presence of endogeneity of regressors and serial-correlation of errors". In this study, we used the dynamic OLS as developed by Kao and Chiang (1998, 2001) and the IV approaches.

We proceed further to investigate the long-run relationship between the variables. Here, we used the Pedroni cointegration test, the Kao residual cointegration test and the standard Johansen Fisher panel cointegration test. The test results presented in Table 3 provide evidence of cointegration amongst the series for most of the tests. So, we conclude that there is evidence of a long-run relationship amongst the variables.

Test methods	Variables	HDI	FDI	PR	GI	TB	FF	BF	TF	IF	UB
Null: unit root (assumes common unit root process)											
LLC t-stat	Level	−5.60	−4.77	−2.91	−6.94	−3.15	−4.99	−0.21	−4.97	0.18	−10.69
	Probability	0.00	0.00	0.00	0.00	0.00	0.00	0.58	0.00	0.57	0.00
	1. difference	−4.58	−13.59	−1.73	−16.83	−10.87	−11.86	−8.07	−11.45	−8.04	−8.42
	Probability	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Null: unit root (assumes individual unit root process)											
ADF Fisher chi-square	Level	57.2	145.9	233.2	197.9	85.3	96.5	60.1	104.6	63.3	213.40
	Probability	0.71	0.00	0.00	0.00	0.00	0.00	0.61	0.00	0.50	0.00
	1. difference	124.0	372.7	240.4	332.1	261.3	218.0	226.7	317.2	179.8	227.38
	Probability	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
PP Fisher chi-square	Level	87.57	235.68	64.81	123.61	101.03	81.47	76.94	112.56	59.16	72.19
	Probability	0.00	0.00	0.11	0.00	0.00	0.02	0.13	0.00	0.65	0.23
	1. difference	267.6	2157.9	269.3	418.2	1102.7	435.3	646.6	1034.6	371.1	226.63
	Probability	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
IPS w-stat	Level	3.66	−6.05	−4.87	−5.39	−0.79	−3.65	−0.17	−3.09	0.52	−6.82
	Probability	0.00	0.00	0.00	0.00	0.00	0.00	0.43	0.00	0.70	0.00
	1. difference	−4.76	−16.94	−9.23	−14.77	−11.97	−12.56	−10.33	−14.39	−8.38	−10.12
	Probability	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Note(s): p-value < 1%

Table 2.
Panel unit root test results

1. Pedroni's cointegration test (deterministic intercept and trend)

Tests	Statistic	p-value	Weighted statistic	p-value
Common autoregressive coefficients (witdin dimension)				
Panel *V*-Statistic	−1.379663	0.9162	−1.703445	0.9558
Panel Rho statistic	*2.417048*	0.9922	*1.625649*	0.9480
Panel PP statistic	−6.440478	0.0000	−8.089539	0.0000
Panel ADF statistic	−6.746566	0.0000	−8.766966	0.0000
Individual autoregressive coefficients (between dimension)				
Group Rho statistic	*3.401834*	0.9997		
Group PP statistic	−9.365716	0.0000		
Group AD statistic	−11.66520	0.0000		

2. Kao residual cointegration test (no deterministic trend)

H_0 : No cointegration	H_1 : cointegration
Test statistic	p-value
−22.68651***	0.0000

Note(s): Decision: reject the null hypothesis and accept the alternative of cointegration

3. Johansen fisher panel cointegration test (linear deterministic trend)

Null hypothesis	Fisher statistic (trace test)	p-value	Fisher statistic (maximum Eigenvalue)	p-value
$r = 0$	27.73	0.9737	64.57	0.0233
$r \leq 1$	371.2	0.9438	371.2	0.0000
$r \leq 2$	894.2	0.0000	593.1	0.0000
$r \leq 3$	457.0	0.0000	269.5	0.0000
$r \leq 4$	236.0	0.0000	163.6	0.0000
$r \leq 5$	123.6	0.0000	80.23	0.0000
$r \leq 6$	127.2	0.0000	127.2	0.0000

Note(s): Cointegration test results were generated by Eviews 9. Null hypothesis: no cointegration. Automatic lag length selection based on SIC with lags from 0 to 2. Sample period is 1996–2017

Table 3.
Panel cointegration
test results

3.2 Econometric strategy
3.2.1 Dynamic OLS approach. The study involves 32 selected African countries from 1996 to 2017. These countries represent high middle income, low middle income and low income. In this study, we first applied the DOLS estimation technique in order to address issues of endogeneity and serial correlation associated with panel time series data. Also, we posit that the effect of the transmission mechanism to HDI is not instantaneous because of the leads and lags of the differenced I(1) regressors in the model. Also, "the DOLS has better finite properties in terms of the bias in both the parameter estimates and the standard errors" (Funk, 2001, p. 729).

With reference to the key objective of the study, we present a standard panel econometric model that links FDI to human development given the presence of reasonable economic freedom. This is presented as follows:

$$Y_{i,t} = \alpha_i + X_{i,t}\beta + \varepsilon_{i,t} \tag{1}$$

where Y is a measure of improvements in human development. This variable incorporates three main dimensions of development namely income, health and education. X is the m-dimensional vector of the series of the data which are integrated of order one i.e. $I(1)$. The subscript $i = 1, 2, \ldots, N$ countries on the continent from time $t = 1, 2, \ldots, T$. ε represents the residuals which are assumed to be stationary, and β is the parameter of the regressors to

be estimated. Next, we specify X as a dynamic function in the form as follows:

$$X_{i,t} = X_{i,t-1} + v_{i,t}$$

We re-write Eqn 1 following Funk (2001) to reflect the panel DOLS estimator as follows:

$$Y_{i,t} = \alpha_i + X_{i,t}\beta + \sum_{j=-q_1}^{q_2} c_{i,j}\Delta_{i,t+j} + u_{i,t} \tag{2}$$

As a follow up to Eqn 2, we present the DOLS estimator as follows:

$$\beta_{DOLS}^* = N^{-1} \sum_{i=1}^{N} \left(\sum_{t=1}^{T} Z_{i,t}Z_{i,t}^i \right)^{-1} \left(\sum_{t=1}^{T} Z_{i,t}Y_{i,t}^* \right) \tag{3}$$

From Eqn 3, $Z_{i,t}$ represents a 2 (K+1)1 vector of the independent variables.

3.2.2 Instrumental variable approach. Given the unsettled debate on the use of DOLS, we instrumented for FDI which is considered endogenous (stemming from measurement error, omitted variables and reverse causality) using its lagged value (previous years' FDI inflows), the log of land area (measure of domestic market size) and legal systems (a measure of legal foundations) as instruments. We acknowledge that these instruments are not new in the FDI literature (see Hagan and Amoah, 2019; Delgado *et al.*, 2014; Borensztein *et al.*, 1998). Against this background, Eqn 1 is re-specified to include a vector of the instruments (Φ). This is presented as Eqn 4.

$$Y_{it} = \alpha_i + X_{it}\beta(\Phi_{it}) + \varepsilon_{it} \tag{4}$$

After including country and year fixed effects (γ_i, λ_t), our estimated model takes the form as follows:

$$\begin{aligned} HDI_{it} = \beta_0 &+ \beta_1 \ln FDI_{it} + \beta_2 TF_{it} + \beta_3 PR_{it} + \beta_3 GI_{it} + \beta_4 TB_{it} + \beta_5 FF_{it} + \beta_6 BF_{it} \\ &+ \beta_6 TF_{it} + \beta_7 IF_{it} + \beta_8 U_{it} + \gamma_i + \lambda_t + \varepsilon_{it} \end{aligned} \tag{5}$$

From Eqs 4 and 5, all variables are as earlier defined. Evidence from the Sargan test presented in Table 4 suggests that the instruments are valid. For robustness purposes, we estimated both DOLS and an IV-model, and present all results in Table 4.

4. Results and analysis
As expected, in Table 4, FDI inflow in model 1 and economic freedom measures from models 2 to 8 will have a positive effect on HDI. Similarly, we expected that FDI inflows in the general model and FDI interacted with measures of economic freedom will bear a positive effect on HDI.

Table 4 presents bivariate results of the various covariates used in the regression, with year and country dummies, to investigate their relationship with HDI. Holding all else constant, the results in models 1, 9 and 10 indicate that inflow of FDI has a positive but insignificant effect on human development in the selected African countries. This finding is in harmony with that of Dollar and Kraay (2004) who observed a positive influence of FDI in enhancing human development. It presupposes that FDI alone cannot improve well-being in Africa if the right absorptive capacities are not put in place. This is plausible because weak and malfunctioning institutions tend to prevail in the absence of economic freedom. This can facilitate activities such as corruption that may erode possible gains associated with FDI inflows in Africa.

Variables	(1) DOLS-FE	(2) DOLS-FE	(3) DOLS-FE	(4) DOLS-FE	(5) DOLS-FE	(6) DOLS-FE	(7) DOLS-FE	(8) DOLS-FE	(9) DOLS-FE	(10) IV
lnfdi inflow	0.0011 (0.001)								0.0005 (0.006)	0.0652 (0.147)
Trade freedom		0.0002*** (0.000)								
Property rights			−0.0002*** (0.000)							
Tax burden				0.0004*** (0.000)						
Investment freedom					0.0003*** (0.000)					
Business freedom						0.0002** (0.000)				
Government integrity							0.0002*** (0.000)			
Financial freedom								−0.0000 (0.000)		
c.lnfdi-inflow#c.investment-freedom									0.0002* (0.001)	0.0032** (0.001)
c.lnfdi-inflow#c.business-freedom									0.0001** (0.000)	0.0120*** (0.002)
c.lnfdi-inflow#c.property-rights									−0.0002** (0.001)	−0.0018*** (0.000)
c.lnfdi-inflow#c.trade-freedom									−0.0001 (0.000)	0.0014 (0.001)
c.lnfdi-inflow#c.taxburden									−0.0001 (0.000)	−0.0181 (0.005)

(*continued*)

Table 4.
Instrumental variable
and DOLS with fixed
effects (FE) panel
regression results

Table 4.

Variables	(1) DOLS-FE	(2) DOLS-FE	(3) DOLS-FE	(4) DOLS-FE	(5) DOLS-FE	(6) DOLS-FE	(7) DOLS-FE	(8) DOLS-FE	(9) DOLS-FE	(10) IV
c. lnfdi-inflow#c.financial-freedom									0.0001* (0.000)	-0.0007** (0.000)
c. lnfdi-inflow#c.government-integrity									-0.0003** (0.000)	-0.0051*** (0.001)
Urbanization									-0.0378*** (0.010)	-0.0807*** (0.013)
Constant	0.6890*** (0.005)	0.6862*** (0.004)	0.7053*** (0.003)	0.6722*** (0.005)	0.6856*** (0.003)	0.6852*** (0.006)	0.6889*** (0.004)	0.6978*** (0.003)	0.6310*** (0.005)	0.5053*** (0.051)
Year dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Country dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	530	701	701	701	701	701	701	701	530	530
R-squared	0.988	0.986	0.986	0.986	0.986	0.986	0.986	0.986	0.991	0.982
Sargan statistic										2.041
p-value										(0.3603)

Note(s): Dependent Variable: HDI. Robust standard errors in parentheses. $*p < 0$, $**p < 0.05$, $***p < 0.01$

Also, following similar findings of Dollar and Kraay (2004), trade freedom in model two shows a positive and significant effect on human development in Africa. Statistically, a unit increase in trade freedom over time among selected countries on average leads to a rise in HDI by about 0.02% at 1% level of significance. Trade freedom is beneficial to African countries because it helps in harnessing technology, physical capital and human capital which promote productivity and improve well-being.

Property rights in model 3 have a significant negative effect on human development. From the statistical point of view, a unit increase in property rights leads to a reduction in HDI by about 0.02% at 1% level of significance. This result goes contrary to general perception and findings by Gwartney and Lawson (2013) and Heritage Foundation (2018) who established that protection of persons and property are key ingredients of economic freedom which promotes human development. However, the negative and significant results in this study are feasible when indigenes of the host country sell off properties to foreigners who because of the protection and enforcement provided under the property rights law, unsustainably exploit the resources of the host country and repatriate the returns thereof to the source country. Also, some expatriates with ownership or control of host countries' resources end up abusing utilization of such resources. This feature has been very prevalent in recent times across the continent, especially in the area of mining. Mining done poorly brings environmental pollution which reduces well-being.

Tax burden in model 4 has a positive effect on HDI. We find that a unit increase in tax burden results in an increase in HDI among selected African countries by about 0.04% at 1% significance level. This could be attributed to the use of selective tax policies to prevent detrimental economic activities which simultaneously improve revenue to government. This helps the government to embark on several social intervention activities that seek to improve human well-being. In the presence of market failures, there is the need for government intervention to provide essential services such as education and healthcare, in order to avoid inefficient outcomes or under-provision of some essential services that seek to benefit the poor and marginalized (see Rosen and Gayer, 2008). It is a fact that most of the countries sampled in this study have low income levels. So, investments by the private sector are not enough for economy-wide development to improve well-being.

Investment freedom and business freedom in models 5 and 6 respectively have a positive and significant effect on HDI. A unit increase in investment and business freedom lead to increases in HDI at 1% and 5% significance levels respectively. By way of explanation, we argue that freedom of choice in investment and freedom in doing business in a free market are important for economic growth which is necessary for development. The Heritage Foundation (2018) reports that freer economies do better in capital accumulation, economic growth and development than less freer economies. A freer market environment promotes efficiency in resource utilization, leading to rising productivity in investment and business activities which easily translate into higher incomes and better well-being. Rising income levels sustained over time promote well-being as individuals would be able to afford necessities of life.

As expected, results shown in model 7, provide evidence of the relevance of government's integrity on human development. Thus, government integrity has a positive and statistically significant effect on human development. Government integrity in governance, accountability and resource utilization brings shared growth and prosperity among people in their jurisdictions. Although levels of integrity in government is weak and low among the selected countries, the results indicate that an improvement in integrity among African governments leads to an improvement in HDI by about 0.02% at 1% significance level. Similarly, Reiter and Steensma (2010) found that the level of corruption is a major threat to poverty reduction and improving human well-being.

With emphasis on the IV results in model 10, we seek to find out whether an exogenous flow of FDI into a country with the right absorptive capacities can translate into improvement in well-being as earlier postulated. To achieve this, we interacted the disaggregated measures of economic freedom with FDI. First, we find a positive and significant effect on human development when FDI is interacted with components of economic freedom measures such as investment freedom, business freedom and financial freedom. Following Azman-Saini *et al.* (2010), this means that FDI inflows bring about a monotonic increase in human development in the presence of investment freedom, business freedom and financial freedom.

In contrast, yet justifiable, FDI inflows along with property rights have a negative and significant effect on HDI. This can be attributed to situations where foreign investors repatriate their profits without reinvesting into expansion, new technology among others that can create job opportunities and improve well-being. This situation is worsened when the property owned by foreigners in the host country is exploited to the detriment of nationals. Inflows in FDI together with property rights enforcement lead to a decrease in HDI by about 0.18% when there is a percentage increase over time across countries.

Also, a negative relationship ensued after we interacted FDI and government integrity. This sounds completely contradictory to theory but very plausible in Africa. Theoretically, government integrity is expected to positively impact on economic growth and human development. However, integrity here, can be considered as a two-way process (i.e. the government/public and private sectors). Government or public sector's integrity is not adequate without the integrity of the private sector which normally dominates in the FDI sector. Mistrust and dishonesty from the foreign firms who end up laundering their returns to the source country end up hurting human development in the host country. A percentage increase in both FDI and government integrity over time across countries brings about a decrease in HDI by about 0.51%.

Furthermore, we found a negative insignificant effect when FDI inflows are interacted with trade freedom and tax burden. FDI inflows through trade liberalization over the years on average have not been beneficial to African countries as a result of capital flight through repatriation. FDI inflows with tax burden have no effect on HDI because taxes increase the cost of doing business, which is not attractive for FDI inflows in a competitive global business world.

FDI and investment freedom have a positive effect on HDI as expected from empirical literature. This presupposes that FDI alone is not enough for development in Africa and must be accompanied by investment-friendly economic environments that promote investment in the host country. This can be attributed to the fact that human development performance among African countries is generally low. A percentage increase in FDI inflows with investment freedom, over time across countries, leads to about 0.32% increase in HDI. Our result is in line with several other studies that have found a positive significant effect of FDI on human development given absorptive capacities (see Heritage Foundation, 2018; Gwartney and Lawson, 2013; Reiter and Steensma, 2010). To the best of our knowledge, it goes without mentioning that studies interacting FDI and investment freedom together are uncommon in the literature.

In addition, a percentage increase in FDI independently with business freedom over time across countries, leads to an increase in HDI by about 1.2%. Also, a percentage increase in FDI accompanied with financial freedom over time across countries, leads to an improvement in HDI by about 0.07%.

A priori, one may expect that urbanization will be associated with lower levels of human development. The reverse is true. Similarly, rising levels of urbanization (urban population growth) without a corresponding increase in demand for urban labour may cause a rise in urban unemployment rate with its associated impact on well-being (see

Harris and Todaro, 1970). From Table 4, we have evidence that a rise in urbanization decreases human development. That is if urbanization rises by 1%, human development decreases by 0.0807.

In a nutshell, we have found that exogenous flows in FDI *per se* have a positive and insignificant effect on HDI. However, FDI interacted with disaggregated economic freedom measures provided the expected results consistent with trends in the literature.

5. Conclusion and recommendations

This study examines the relationship between FDI inflows, economic freedom and human development for 32 African countries for the period 1996 to 2017. The purpose of the study is to investigate whether FDI inflows is contingent on some absorptive capacities in improving human development. We focused on FDI to high middle income, low middle income and low-income countries based on availability of data. Dynamic OLS with fixed effects and IV panel data modelling approaches were adopted in order to deal with possible identification issues associated with such data.

Our empirical results reveal that FDI alone has no statistically significant effect on human development. However, three possible results are realized after interacting FDI with disaggregated economic freedom variables. First, we found that interacting FDI with variables such as investment freedom, business freedom and financial freedom are statistically significant and impact positively on HDI. Second, we interacted FDI with variables such as property rights and government integrity and found a negative and statistically significant effect on HDI. Finally, we interacted FDI with variables such as trade freedom and tax burden and found no statistically significant effect on HDI. In all, for African countries, we argue that some absorptive capacities play a critical role in the FDI–HDI nexus. That notwithstanding, our evidence is mixed yet justified.

Following the findings of the study, we recommend that African countries should promote FDI in tandem with economic freedom measures such as investment freedom, business freedom and financial freedom as they mean a lot to human development in our quest to achieving the SDGs by 2030. In addition, for property rights, because of the tendency that foreign firms may abuse the use of properties (resources) acquired from the hosting countries, we recommend stringent regulation to avert possible negative effects on human development. Also, for government integrity, we recommend that it is checked by well-developed democratic systems. This can be achieved when measures of good governance that seek to regulate and promote integrity are constitutionalized to control corruption in Africa and improve human development.

Indeed, FDI and other developmental policy agenda that seek to promote human development should be built around the relevant economic freedom variables. Given the magnitude of the coefficients, it is indeed important to attract FDI into all the other sectors that can improve health, income and education as these translate into human development in the region. By this, African countries can be confident in contributing markedly to the achievement of SDGs by 2030.

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Appendix

Variable	Notation	Description and sources
Dependent variable Human development index	HDI	Real GDP per capita is the annual percentage growth rate of output in constant 2010 local currency, divided by the midyear population. Real GDP is measured by the summation of gross value added by all producers in the economy plus net indirect taxes. Source: WDI (2018)
Explanatory variables Foreign Direct Investment	FDI	Foreign direct investment is the net inflows of investment to acquire a lasting management interest (10% or more of voting stock) in an enterprise operating in an economy other than that of the investor. It is the sum of equity capital, reinvestment of earnings, other long-term capital and short-term capital as shown in the balance of payments. This series shows net inflows (new investment inflows less disinvestment) in the reporting economy from foreign investors and is divided by GDP Source: WDI (2018)
Trade freedom	TF	Trade freedom is a composite measure of the extent of tariff and nontariff barriers that affect imports and exports of goods and services. It is measured on a scale of 0 (lowest) to 100 (highest) based on two inputs as follows: the trade-weighted average tariff rate and nontariff barriers (NTBs) Source: The Heritage Foundation (2018)
Property rights	PR	Property rights component assesses the extent to which a country's legal framework allows individuals to accumulate private property freely, secured by clear laws that the government enforces effectively. Relying on a mix of survey data and independent assessments, it provides a quantifiable measure of the degree to which a country's laws protect private property rights and the extent to which those laws are respected. It also assesses the likelihood that private property will be expropriated by the state. It is measured on a scale of 0 (lowest) to 100 (highest) Source: The Heritage Foundation (2018)
Tax burden	TB	Tax burden is a composite measure that reflects marginal tax rates on both personal and corporate income and the overall level of taxation (including direct and indirect taxes imposed by all levels of government) as a percentage of gross domestic product (GDP). It is measured on a scale of 0 (lowest) to 100 (highest) Source: The Heritage Foundation (2018)
Investment freedom	IF	The index evaluates a variety of regulatory restrictions that typically are imposed on investment. Points, as indicated below, are deducted from the ideal score of 100 for each of the restrictions found in a country's investment regime. It is not necessary for a government to impose all the listed restrictions at the maximum level to eliminate investment freedom. The few governments that impose so many restrictions that they total more than 100 points in deductions have had their scores set at zero Source: The Heritage Foundation (2018)
Business freedom	BF	The business freedom component measures the extent to which the regulatory and infrastructure environments constrain the efficient operation of businesses. The quantitative score is derived from an array of factors that affect the ease of starting, operating and closing a business. The business freedom score for each country is a number between 0 and 100, with 100 indicating the freest business environment Source: The Heritage Foundation (2018)

Table 5.
Data description, measurement and sources

(continued)

Variable	Notation	Description and sources
Government integrity	GI	Corruption erodes economic freedom by introducing insecurity and coercion into economic relations. Of greatest concern is the systemic corruption of government institutions and decision-making by such practices as bribery, extortion, nepotism, cronyism, patronage, embezzlement and graft. The lack of government integrity caused by such practices reduces economic vitality by increasing costs and shifting resources into unproductive lobbying activities Source: The Heritage Foundation (2018)
Financial freedom	FF	Financial freedom is an indicator of banking efficiency as well as a measure of independence from government control and interference in the financial sector. State ownership of banks and other financial institutions such as insurers and capital markets reduce competition and generally lower the level of access to credit Source: The Heritage Foundation (2018)
Urbanization	UB	This is the annual percentage growth in population in areas classified as urban Source: WDI (2018)

Table 5.

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